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Norwich, Connecticut
Clean School Bus Project

Background

Beginning in January 2000, the Connecticut Department of Environmental Protection (DEP), the Northeast States for Coordinated Air Use Management (NESCAUM), and the City of Norwich School System have developed and are implementing a program to reduce risk exposure from diesel school bus exhaust through a multi-faceted approach.

The Norwich project is the first successful, full fleet, system-wide school bus retrofit project in the Northeast and will serve as a pilot for the development of similar programs statewide as part of Connecticut DEP's Clean School Bus Program and can be used as a model program nationally.

Through the use of clean fuel and emission control devices on school buses, the risk of student/driver exposures to diesel exhaust while riding school buses will be reduced. The pollutant of greatest concern, particulate matter, has been targeted for reduction.

Unique to this program is that it includes not only emission control strategies, but also a curriculum component that will bring the results of the project into the middle school classroom. Students will learn about the harmful health effects of diesel exhaust and implementation strategies to reduce their exposure.

A monitoring component will evaluate the effectiveness of various control strategies in reducing both overall emissions and reducing child passenger exposure to these pollutants.

Objective

- To reduce emissions from diesel school buses in Norwich, Connecticut and to lower children's exposure to diesel exhaust.
- To create a project that can be used as a model for other municipalities in Connecticut to achieve emission reductions.

Current Project Status and Outreach

The Department of Environmental Protection (DEP) through Supplemental Environmental Project (SEP) funds has retrofitted 42 diesel powered school buses in the Norwich Public School bus fleet with emission reduction devices. These devices will consist of diesel oxidation catalysts or particulate filters. The SEP funds have also been used to offset the increased cost of cleaner ultra-low sulfur diesel (ULSD) fuel that will be used for the duration of the project. All 52 Norwich diesel school buses are running on ULSD. The Mohegan Tribal Council is providing funds to Norwich Public Schools to provide for additional fuel and the construction of a tank to store the ultra-low diesel fuel.

The following tasks have been completed:

- Retrofits: 42 buses total retrofitted. (one installation of an oxidation catalyst will be completed by the end of April). Nine buses have been retrofitted with diesel particulate filters and 32 buses have been retrofitted with diesel oxidation catalysts.

- Fuel: Delivery of the ULSD fuel started in July 2002 and will continue throughout the project. Currently all school buses in Norwich are using ULSD fuel. The cost is slightly higher than typical diesel fuel, at a cost of $0.12 - $0.20 per gallon above the cost of regular diesel.

- Inspection: Part of the duties of the Department of Motor Vehicles (DMV) is to ensure that all school buses meet the appropriate safety standards established for the State of Connecticut. Modification of a school bus (i.e., installation of retrofits) requires DMV's approval. DMV has approved the procedure for installing and placement of the retrofits and has completed safety inspections of all the installed retrofits.

- Curriculum:

  An air quality curriculum to disseminate and discuss air quality information within the classroom is being developed. The Norwich Public Schools, which is serving as a model for others is developing a pilot air quality curriculum. The air quality curriculum will be field-tested and initially integrated into the City of Norwich School System's Grade 6 – 8 science classes.

  Upon completion, the curriculum will be used throughout the state of Connecticut.

Benefit of Controls

- The use of ultra low sulfur diesel fuel and retrofits with emission control equipment will reduce diesel PM emissions by as much as 90 percent in the Norwich school buses.

- Hydrocarbon and carbon monoxide emissions will be reduced by approximately 70 percent through the use of emission control devices.

Other states in the Northeast have established diesel retrofit programs. These programs have included non-road equipment such as construction machines, as well as highway vehicles such as residential and commercial waste collection trucks, long haul trucks, school buses, and urban buses. Other states participating in similar programs include California, Oregon, and Pennsylvania.

Future Tasks

Tailpipe testing and passenger exposure monitoring will begin in the late spring of 2003. This testing is important as the emission testing of retrofitted school buses is relatively sparse. Furthermore, the project will evaluate the effectiveness of these devices in reducing the exposure of students riding on the bus. It is anticipated that the testing will evaluate the effectiveness of the use of ultra-low sulfur diesel fuel, diesel oxidation catalysts and diesel particulate filters in reducing passenger exposure and overall emissions.

Partnership

U.S. Environmental Protection Agency (EPA); CT Department of Environmental Protection (DEP); CT Department of Motor Vehicles (DMV); CT Department of Public Health (DPH); Northeast States for Coordinated Air Use Management (NESCAUM); Norwich Public Schools; The Mohegan Tribal Council; First Student, Inc.; Fleetguard Emission Solutions; Cummins Metropower; Sprague Energy; Johnson Matthey, Inc.; CT School Transportation Association (COSTA); and Uncas Health District.